Task 1.1a: Light Scattering Methods Evaluation

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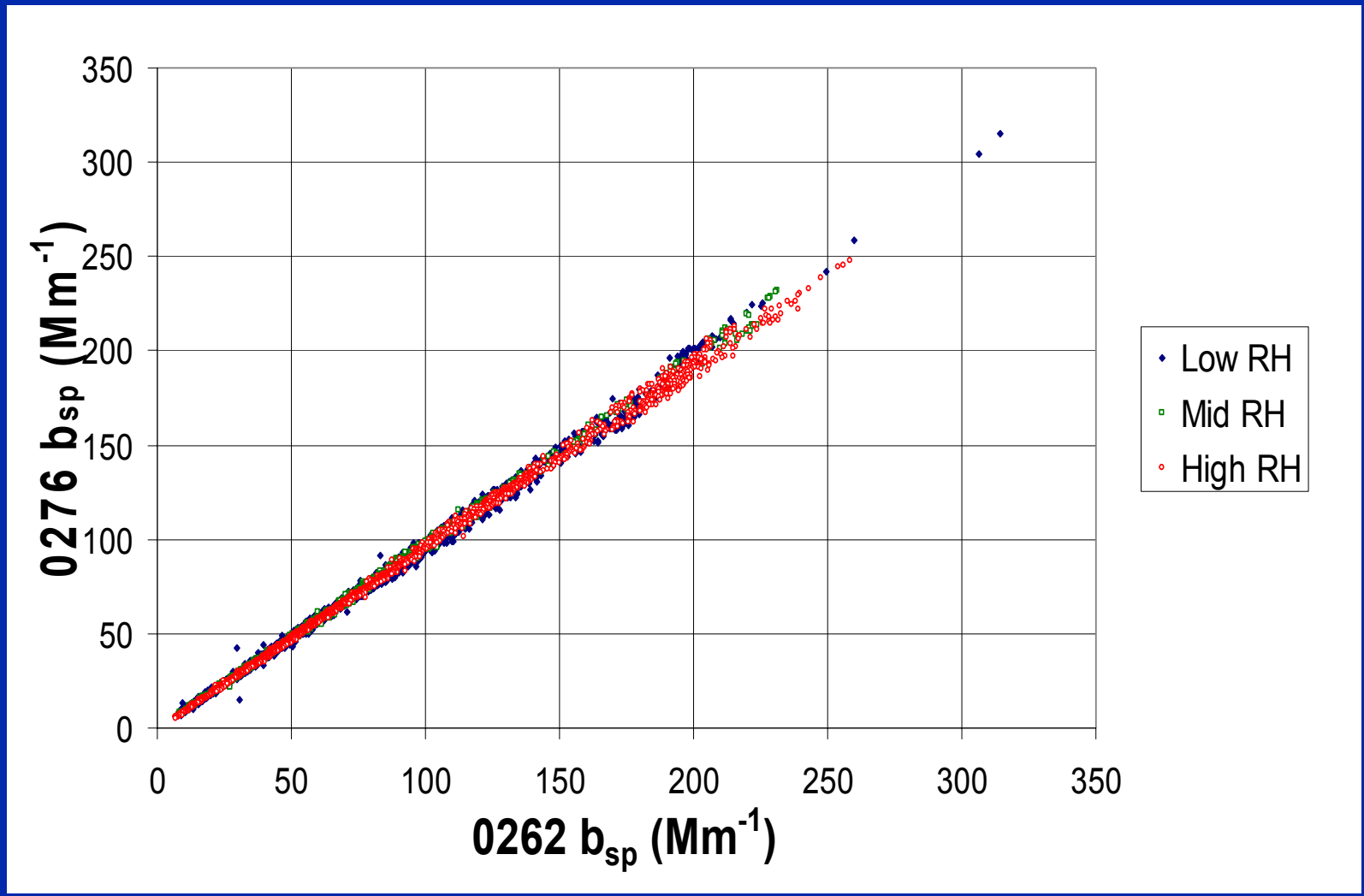
Geographical and Temporal Resolution

- Light scattering by particles (b_{sp}) was measured with 5-min time resolution by Radiance Research nephelometers.
- 56 nephelometers.
- 77 sites.
- Continuous measurements for a year or more at 15 of these sites.

The b_{sp} Data are Precise and Repeatable

- Precision and repeatability demonstrated by intercomparison of four nephelometers and by comparing field data from FREM and FRES.


350
300
250
200
150
100
50
0
0276 b_{sp} (Mm^{-1})
0
50
100
150
200
250
300
350
0262 b_{sp} (Mm^{-1})
Low RH
Mid RH
High RH

The b_{sp} Data are Accurate

- The data provide an accurate measure of b_{sp} in the scattering chamber.
- When 24 outliers were removed, the remaining 367 calibrations and audits of 52 nephelometers at 71 sites gave:
  - Average zero of 0.4 ± 1.4 Mm^{-1}
  - Average span slope of 0.99 ± 0.05

For Tomorrow

- Relation between measured b_{sp} and $PM_{2.5}$ and PM_{10} concentrations:
  - In summer and winter seasons.
  - As a function of the RH measured in the nephelometer scattering chamber.
  - As a function of measured ambient LWC.
- Advice on the use of the b_{sp} data.